

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-5 and 8-21 are pending in the application, with claims 1 and 11 being the independent claims. Claims 1 and 11 are sought to be amended. These changes are believed to introduce no new matter and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding rejections and that they be withdrawn.

Information Disclosure Statement

The Office Action, at pages two and three, contends that:

The information disclosure statement filed 11/25/2005 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the references are geared towards a vehicle wheel device, which unrelated to minimizing the amount of data needed to test data against subarea boundaries in spatially composited digital video. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any resubmission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Applicants note (as apparently did the Examiner) that the Form PTO-1449 attached to the Office Action is for U.S. Patent Application No. 11/058,050, not the instant patent application, U.S. Patent Application No. 10/058,050. Because of the similarity of these two patent application serial numbers and because U.S. Patent Application No. 11/058,050 is not

being prosecuted by Applicants' representatives, Applicants believe that the incorrect Information Disclosure Statement was routed to the Examiner by personnel at the United States Patent and Trademark Office.

Accordingly, Applicants resubmit a copy of the Second Supplemental Information Disclosure Statement along with a copy of its attached Form PTO-1440 and a copy of the postcard filed with the Amendment and Reply Under 37 C.F.R. § 1.111 on March 1, 2006, and date stamped by the Office of Initial Patent Examination. The postcard indicates that the Second Supplemental Information Disclosure Statement was included with the filing of the Amendment and Reply Under 37 C.F.R. § 1.111.

Moreover, Applicants file herewith a Third Supplemental Information Disclosure Statement. Although Applicants believe that Applicants should not be required to pay the fee under 37 C.F.R. § 1.17(p) for the resubmission of the Second Supplemental Information Disclosure Statement, because Applicants file herewith payment for the fee under 37 C.F.R. § 1.17(p) for the Third Supplemental Information Disclosure Statement, any dispute regarding payment for the fee under 37 C.F.R. § 1.17(p) for the resubmission of the Second Supplemental Information Disclosure Statement is rendered moot.

Rejections Under 35 U.S.C. § 103

Claims 1-5 and 8-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,326,964 to Snyder *et al.* (hereinafter "Snyder"). (See Office Action at p. 3.) Applicants respectfully traverse these rejections.

Amended independent claim 1 recites, *inter alia*, "wherein said graphics pipelines are configured to render the frame by spatial compositing through parallel processing." Independent claim 11 has been amended in a similar manner.

These amendments are supported throughout the specification of the instant patent application and particularly at paragraphs 0013 through 0016, which state:

The use of multiple processors in computer graphics hardware not only enables stages in a graphics pipeline to be processed simultaneously, but also allows for additional graphics pipelines for parallel processing. Graphics architectures have utilized these additional pipelines to process succeeding frames of images to support changes in a scene with time. . . . Another type of compositing, called spatial compositing, also marks a major advancement in computer graphics performance. Like temporal compositing, spatial compositing relates to an approach to optimizing the utilization of multiple graphic units, and thus multiple pipelines. Rather than having each graphics unit or pipeline render an entire frame or a sequence of frames and having the output of each graphics unit combined temporally, spatial compositing uses each graphics unit to render a portion of each overall frame and combines the output of each graphics unit spatially with respect to the location of the rendered portion within the overall frame. By reducing the amount of graphics data (which may include geometry data) communicated to each graphics unit, spatial compositing increases the rate at which an overall frame is rendered.

These amendments are also particularly supported at paragraph 0040 of the instant patent application, which states:

The present invention relates to an approach to optimizing the utilization of multiple graphics units, and thus multiple pipelines. Rather than having each pipeline render an entire frame of a sequence of frames and having the output of each pipeline combined temporally, spatial compositing uses each pipeline to render a portion of each overall frame and combines the output of each pipeline spatially with respect to the location of the rendered portion within the overall frame. By reducing the amount of graphics data that each processor must act on, spatial compositing increases the rate at which an overall frame is rendered.

Snyder does not disclose, teach, or suggest graphics pipelines configured to render a frame by spatial compositing through parallel processing. To the contrary, Snyder teaches

away from spatial compositing through parallel processing. For example, column 4, line 45 through column 5, line 55 of Synder states:

To achieve real-time, interactive effects, high-end graphics systems use parallel rendering engines. Three basic parallel strategies have been developed to handle the problems with large frame buffer: (1) pipelining the rendering process over multiple processors; (2) dividing frame buffer memory into groups of memory chips each with its own processor; and (3) combining processing circuitry on the frame buffer memory chips with dense memory circuits. These techniques have improved the processing of graphics systems using large frame buffers, but have also dramatically increased the cost of these systems.

Even with expensive parallel processing techniques, it is very difficult to support sophisticated anti-aliasing technique. . . . Image compression techniques also cannot be easily used on a graphic system using a frame buffer during image processing. The parallel processing techniques used to accelerate processing in a graphics system with a frame buffer cause hurdles for incorporating compression techniques. During parallel processing, any portion of the frame buffer can be accessed at random at any instance of time. Most image compression techniques require that image data not change during the compression processing so the image data can be decompressed at a later time.

In frame buffer architectures the expensive memory and parallel processing hardware is always under-utilized because only a small fraction of the frame buffer memory or parallel processing units are actively being used at any point in time. . . . Low cost, high-quality, real-time processing of 3-D graphics images without using a large expensive frame buffer, or parallel processing techniques has been an elusive quest for the last three decades. As is apparent from the issues outlined above, there is a need for an improved architecture capable of generating high-quality images, at a much lower cost.

Furthermore, column 35, line 55 through column 36, line 8 of Synder states:

In the implementation of the tiler shown in FIGS. 9A-9C, chunks are used sequentially to render an entire frame on one processor, rather than using multiple simultaneous chunks on parallel processors to share the computational load. Although less preferred, a combination of serial and parallel processing of chunks could also be used. Using a completely parallel processing implementation of chunks, an object moving across the screen would necessarily require constant chunking operations as it moved across the screen. However, in the illustrated embodiment of the invention, because of the serial processing of chunks, an object can be fixed at the chunk boundaries in a gsprite and thus NOT require chunking as the object moved across the screen. The parallel processing rendering of chunks also does not allow

sophisticated anti-aliasing and texturing schemes to be applied to individual chunks as is the case for serial rendering of chunks. The chunk size and sequential rendering is very valuable for image compression techniques since an entire 32x32 pixel chunk is rendered before the next chunk is computed, and thus can be compressed immediately.

(*See also* Snyder at figures 5A, 5B, 6, 17A, 17B, 21A, 21B, 26, 28A through 28F, and 29, which depict serial processes.)

Thus, amended independent claims 1 and 11 are patentable over Snyder. Claims 2-5, 8-10, and 12-21, which depend upon claims 1 or 11, are also patentable over Snyder for this reason and because of the individual distinctive features of claims 2-5, 8-10, and 12-21. Therefore, Applicants respectfully request that the Examiner reconsider claims 1-5 and 8-21 and remove the rejections of these claims under 35 U.S.C. § 103(a).

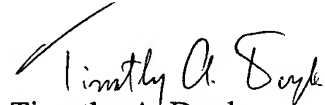
Conclusion

All of the stated grounds of rejection have been properly traversed. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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